

CLAIMS

WHAT IS CLAIMED IS:

1. A device for protecting a ground fault circuit interrupter (GFCI) circuit from harmful power conditions, the GFCI including a surge protector component, the
5 device comprising:

a filter connected across the power inputs of the GFCI circuit for filtering transient power surges to the surge protector component.

2. The device of claim 1, wherein the surge protector component includes a
10 metal oxide varistor (MOV).

3. The device of claim 1, wherein the filter is a low pass filter.

4. The device of claim 1, wherein the filter includes an LC circuit having:
15 a filter capacitor; and
a filter inductor.

5. The device of claim 4, wherein the filter capacitor is a by-pass capacitor of the GFCI circuit.

6. The device of claim 4, wherein the filter inductor is a solenoid of the GFCI circuit for actuating a relay between a transformer and a load.

7. The device of claim 1, further comprising:
an overvoltage prevention circuit, including a spark gap device connected
across the power inputs of the GFCI circuit.

5 8. The device of claim 7, wherein, during an overvoltage condition, the
overvoltage prevention circuit limits the voltage applied to the surge protection
component, and the filter limits the current applied to the surge protection component.

9. A ground fault circuit interrupter (GFCI) circuit comprising:
10 a surge protector component connected across a set of power inputs;
a by-pass capacitor connected to the surge protector component;
a bridge circuit connected to the surge protector component and including
a plurality of diodes;
a GFCI processor connected to the bridge circuit;
15 a ground transformer connected to the GFCI processor;
a sensing transformer connected to the GFCI processor;
a solenoid;
a relay mechanism actuated by the solenoid, wherein the ground
transformer, the sensing transformer, and the relay mechanism connect the set of power
20 inputs to a load; and
a suppression and protection circuit connected to the surge protector
component and including:

a filter connected across the power inputs for filtering transient power surges to the surge protector component.

10. The GFCI circuit of claim 9, wherein the surge protector component
5 includes a metal oxide varistor (MOV).

11. The GFCI circuit of claim 9, wherein the filter is a low pass filter.

12. The GFCI circuit of claim 9, wherein the filter includes an LC circuit
10 having:
a filter capacitor; and
a filter inductor.

13. The GFCI circuit of claim 12, wherein the filter capacitor is the by-pass
15 capacitor.

14. The GFCI circuit of claim 12, wherein the filter inductor is the solenoid.

15. The GFCI circuit of claim 12, further comprising:
20 an overvoltage prevention circuit, including a spark gap device connected
across the power inputs.

16. The GFCI circuit of claim 15, wherein, during an overvoltage condition, the overvoltage prevention circuit limits the voltage applied to the surge protection component, and the filter limits the current applied to the surge protection component.

5 17. A method for protecting a ground fault circuit interrupter (GFCI) circuit from harmful power conditions, the GFCI including a surge protector component, the method comprising the step of:

filtering transient power surges from power inputs to the surge protector component using a low pass filter.

10 18. The method of claim 17, wherein the step of filtering is performed by an LC circuit, having a capacitor and an inductor, as the low pass filter.

15 19. The method of claim 17, further comprising the step of:
reducing voltages to the surge protector component during overvoltage conditions using a spark gap device connected across the power inputs.

20 20. The method of claim 19, wherein, during an overvoltage condition, the spark gap device limits the voltage applied to the surge protection component, and the filter limits the current applied to the surge protection component.